

CLAIMS

We claim:

1. A feed structure for a horn antenna comprising:
a first waveguide having at least a first wall; and
a second waveguide comprising a first portion at least partially disposed within said first waveguide and a second portion intersecting said first wall;
wherein said first wall comprises a first frequency selective surface at an intersection of said first wall and said second portion of said second waveguide.
2. The feed structure of claim 1 wherein said first waveguide is operatively coupled to a first horn section.
3. The feed structure of claim 1, wherein said second portion is operatively coupled to a second horn section.
4. The feed structure of claim 1, wherein said first portion of said second waveguide includes at least one wall comprising a second frequency selective surface.
5. The feed structure of claim 4 further comprising a first feed probe disposed within said first waveguide.
6. The feed structure of claim 5 wherein RF signals generated by said first feed probe are reflected by said first frequency selective surface.
7. The feed structure of claim 5 wherein RF signals generated by said first feed probe propagate through said second frequency selective surface.
8. The feed structure of claim 4 further comprising a second feed probe disposed within said second portion of said second waveguide.
9. The feed structure of claim 8 wherein RF signals generated by said second feed probe propagate through said first frequency selective surface.

10. The feed structure of claim 8 wherein RF signals generated by said second feed probe are reflected by said second frequency selective surface.
11. The feed structure of claim 1 further comprising a third waveguide, said third waveguide comprising:
 - a first portion at least partially disposed within said second waveguide;
 - a second portion intersecting a wall of said second waveguide; and
 - a third portion intersecting at least one of said first wall and a second wall of said first waveguide;wherein said second waveguide wall comprises a third frequency selective surface at an intersection of said second waveguide and said second portion of said third waveguide; and
said at least one of said first and second wall of said first waveguide comprises a fourth frequency selective surface at an intersection of said third portion of said third waveguide and said at least one of said first and second wall.
12. The feed structure of claim 11, wherein said third waveguide is operatively coupled with a third horn section.
13. The feed structure of claim 11, wherein said first portion of said third waveguide includes at least one wall comprising a fifth frequency selective surface.
14. The feed structure of claim 13 further comprising a first feed probe disposed within said first waveguide.
15. The feed structure of claim 14 wherein RF signals generated by said first feed probe propagate through said third and fifth frequency selective surfaces.
16. The feed structure of claim 14 wherein RF signals generated by said first feed probe are reflected by said fourth frequency selective surface.
17. The feed structure of claim 13 further comprising a second feed probe disposed within said second portion of said second waveguide.

18. The feed structure of claim 17 wherein RF signals generated by said second feed probe propagate through said fifth frequency selective surface.
19. The feed structure of claim 17 wherein RF signals generated by said second feed probe are reflected by said third frequency selective surface.
20. The feed structure of claim 13 further comprising a third feed probe disposed within said third portion of said third waveguide.
21. The feed structure of claim 20 wherein RF signals generated by said third feed probe propagate through said third and fourth frequency selective surfaces.
22. The feed structure of claim 20 wherein RF signals generated by said third feed probe are reflected by said fifth frequency selective surface.
23. A waveguide combining network comprising:
 - a first waveguide having at least a first wall; and
 - a second waveguide intersecting said first wall;wherein said first wall comprises a first frequency selective surface at an intersection of said first wall and said second waveguide.
24. The waveguide combining network of claim 23, wherein RF signals propagating within said second waveguide propagate through said first frequency selective surface and RF signals propagating within said first waveguide are reflected by said first frequency selective surface.
25. The waveguide combining network of claim 23 further comprising:
 - a third waveguide intersecting at least one of said first wall and a second wall of said first waveguide;wherein said at least one of said first wall and said second wall comprises a second frequency selective surface at an intersection of said third waveguide and said at least one of said first wall and said second wall.

26. The waveguide combining network of claim 25, wherein RF signals propagating within said third waveguide propagate through said second frequency selective surface and RF signals propagating within said first waveguide are reflected by said second frequency selective surface.